

**REMARKS**

Claims 1, 2 and 6-10 are pending in this application. By this Amendment, claims 1 and 2 are amended and claims 4 and 5 are canceled. Support for the amendments to the claims may be found, for example, in the claims as originally filed. No new matter is added.

In view of the foregoing amendments and following remarks, reconsideration and allowance are respectfully requested.

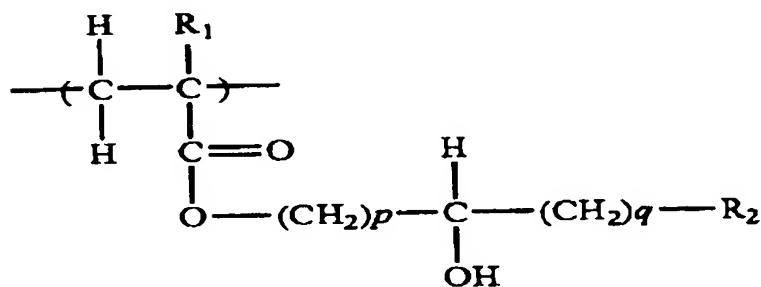
**I. Rejections Under 35 U.S.C. §103**

**A. Takei**

The Office Action rejects claims 1, 2, 4-6 and 8-10 under 35 U.S.C. §103(a) over WO 02/05035 to Takei et al. ("Takei") (citations from English equivalent, U.S. Patent Application Publication No. 2003/0146416). By this amendment, claims 4 and 5 are canceled thus the rejection is moot as to those claims. As to the remaining claims, Applicants respectfully traverse the rejection.

By this amendment, claim 1 recites, *inter alia*, "a gap fill material forming composition ... wherein the composition comprises a polymer having a weight average molecular weight of 5,000 to 20,000 that is composed of only structural unit of formula (1)

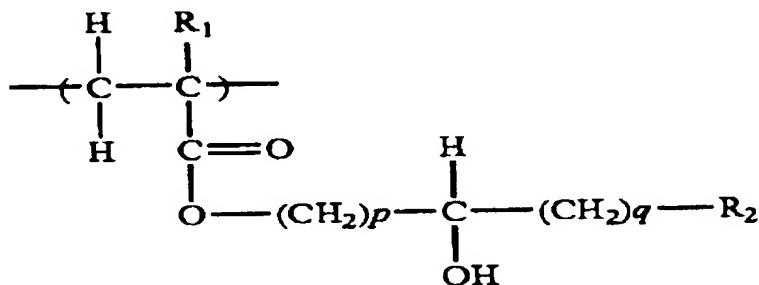
(1)



wherein R<sub>1</sub> is hydrogen atom, methyl group, chlorine atom or bromine atom, R<sub>2</sub> is hydrogen atom or hydroxy group, p is the number of 1, 2, 3 or 4, q is the number of 0, 1, 2 or 3, and

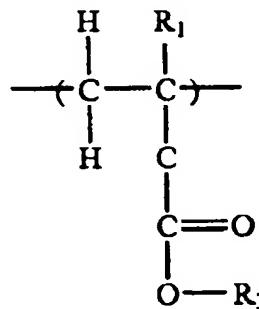
containing components having a molecular weight of 3000 or less in a rate of 20% or less; a crosslinking agent; and a solvent selected from the group consisting of butyl lactate, propylene glycol monobutyl ether, propylene glycol monomethyl ether, propylene glycol monomethyl ether acetate and cyclohexanone." Additionally, by this amendment, claim 2 recites, *inter alia*, "a gap fill material forming composition ... wherein the composition comprises a polymer having a weight average molecular weight of 5,000 to 20,000 that is composed of structural unit of formula (1) and structural unit of formula (2)

(1)



wherein R<sub>1</sub> is hydrogen atom, methyl group, chlorine atom or bromine atom, R<sub>2</sub> is hydrogen atom or hydroxy group, p is the number of 1, 2, 3 or 4, q is the number of 0, 1, 2 or 3; and

(2)



wherein R<sub>1</sub> is as defined above, R<sub>3</sub> is C<sub>1-8</sub> alkyl group, benzyl group, C<sub>1-6</sub> alkyl group substituted by at least one fluorine atom, chlorine atom or bromine atom, or C<sub>1-6</sub> alkyl group substituted by at least one C<sub>1-6</sub> alkoxy group, and the polymer containing components having

a molecular weight of 3000 or less in a rate of 20% or less, and containing the structural unit of formula (1) in a ratio of 0.40 to 0.95; a crosslinking agent; and a solvent selected from the group consisting of butyl lactate, propylene glycol monobutyl ether, propylene glycol monomethyl ether, propylene glycol monomethyl ether acetate and cyclohexanone, wherein the sum of the molar ratio of structural unit of formula (1) and the molar ratio of structural unit of formula (2) is 1." Applicants respectfully assert that Takei fails to disclose, and would not have rendered obvious, at least the above features of claims 1 and 2.

The Office Action, on page 3, asserts that Takei discloses that the polymer is preferably a polymer that contains at least one or more hydroxyl groups per repeating unit and that Takei exemplifies polymers obtained by polymerizing compounds such as hydroxyalkyl acrylates or hydroxyalkyl methacrylates. However, paragraphs [0062]-[0069] recite 53 possible compounds that may be polymerized to be the polymer in the composition forming a gap-filling material. In contrast, present claim 1 recites a polymer with one specific structure, and present claim 2 recites a polymer with two specific structures. Applicants respectfully assert that the broad disclosure of Takei is insufficient to have rendered obvious the specific polymer structures recited in claims 1 and 2.

The Office Action also asserts that Takei discloses that the solvent used for the composition for forming the gap-filling material may be butyl lactate, cyclohexanone, propylene glycol monobutyl ether or propylene glycol monomethyl ether acetate. However, in paragraph [0097], Takei discloses at least 34 solvents that may be used in the composition for forming a gap-filling material. Furthermore, Takei disclosed that those solvents can be used alone, or in combinations of two or more. In contrast, claims 1 and 2 recite five specific solvents that may be used to form a gap-filling material.

Considering the 53 compounds that can be used to form the polymer in the gap-filling material and the 34 possible solvents (or many more possible combinations of solvents) that

can be used in the gap-filling material, Takei discloses no less than 1,802 possible combinations of compounds that may be used to form the polymer in the gap-filling material and solvents that may be used in the gap-filling material. Even if one were only to consider the preferred solvents disclosed in paragraph [0099] of Takei, this still leaves at least 265 possible combinations of compounds that may be used to form the polymer in the gap-filling material and solvents. In contrast, claim 1 recites five possible combinations of polymers and solvents, and claim 2 recites ten possible combinations of polymers and solvents. Additionally, if one of ordinary skill in the art were to have chosen one of the 5 or 10 claimed combinations from the 1,802 possible combinations of Takei, that person would then have been required to modify the combination to be within the claimed molecular weight ranges. Applicants respectfully assert that the selection of the five or ten claimed combinations and the above modification would not have been obvious.

Nowhere does Takei provide any reason or rationale for one of ordinary skill in the art to have chosen the one or two specifically claimed polymers and the five specifically claimed solvents. Specifically, Takei does not provide any benefit of using the claimed combinations. However, the present specification, at paragraph [0044], recites that the use of the claimed solvents "brings about a maintenance of fluidity of the gap fill material forming composition in baking process for a predetermined time, and therefore filling property into the inside of holes and flattening property can be improved." Thus, the present specification recites unexpectedly improved filling and flattening properties when using the claimed polymers and solvents, but Takei does not provide any reason or rationale for one of ordinary skill in the art to have chosen the one or two specific polymers and five specific solvents as recited in claims 1 and 2. Accordingly, Applicants respectfully assert that Takei would not rendered obvious the specific features recited in claims 1 and 2.

Claims 1 and 2 would not have been rendered obvious by Takei. Claims 6 and 8-10

variously depend from claim 1 and thus also would not have been rendered obvious by Takei.

Accordingly, reconsideration and withdrawal of the rejection are respectfully requested.

**B. Takei in View of Rutter**

The Office Action rejects claim 7 under 35 U.S.C. §103(a) over Takei in view of U.S. Patent Application Publication No. 2002/0110665 to Rutter et al. ("Rutter"). Applicants respectfully traverse the rejection.

For at least the reasons stated above, claim 1 would not have been rendered obvious by Takei. Further, the Office Action applies Rutter as disclosing an aperture fill material comprising a cross-linkable polymer with hydroxyl groups, one or more crosslinking agents, one or more acid catalysts and a solvent. Thus, Rutter is not applied to address the above discrepancies of Takei as to claim 1. Accordingly, Takei and Rutter, individually or in combination, would not have rendered obvious each and every feature of claim 1.

Claim 1 would not have been rendered obvious by Takei and Rutter, individually or in combination. Claim 7 depends from claim 1 and thus claim 7 also would not have been rendered obvious by Takei and Rutter, individually or in combination. Accordingly, reconsideration and withdrawal of the rejection are respectfully requested.

**II. Conclusion**

In view of the foregoing, it is respectfully submitted that this application is in condition for allowance. Favorable reconsideration and prompt allowance of the application are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number set forth below.

Respectfully submitted,



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JAO:NAB/mkg

Attachments:

Petition for Extension of Time  
Request for Continued Examination

Date: April 2, 2009

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